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A Season Among Italian Bees.

[Several years ago, Professor Mona, of Italy, undertook to establish an apiary for the purpose of rearing Italian queen bees to supply the foreign demand for them, which sprung up after the Italian bees were introduced into Germany, and their superior value became known and appreciated. The business which he thus originated prospered beyond expectation, and soon rendered it necessary that he should procure a competent assistant. He accordingly engaged the services of Mr. Uhle, a practical apiarian of great in elligence and experience, who joined him at Faido, in the spring of 1866, after the apiaries had been removed to Faido, in the canton of Tessin. At the close of the year, Mr. Uhle sent a communication to the *German Bienenzeitung*, from which the following extracts are taken.]

Having from personal observation satisfied myself of the superiority of the Italian bees, having read the various articles contained in the *Bienenzeitung* exhibiting their great value and importance, as also the excellent treatise on "the Italian Bee," published by Mr. Kleine, I came here in April last with intensified expectations.

Professor Mona had given up his school to devote himself exclusively to bee culture, and taken up his abode at his paternal home in Faido, though his bees still remained, for the most part, in the neighborhood of Pollegio.

Since the 1st of March, the business of supplying orders by sending out full colonies, driven swarms and single queens, had been recommenced; and now rapidly increased, as the weather grew milder and the roads improved.

The excursions, which I had occasion to make to his different apiaries, enabled me to obtain a comprehensive view of Prof. Mona's arrangements and modes of operating. There were in all about three hundred stocks, with which the active campaign was opened on the 1st of May. Among these were large as well as small movable comb hives, common log hives or "gums," such as are used in the rural districts, and ordinary box hives of various shapes and sizes. The former were similar to those with which I was familiar in Germany; the others did not impress me favorably, though the exceeding industry of their inmates soon reconciled me to their appearance.

The movable comb hives were deprived of their queens in the course of the month. The larger ones were then used as store stocks for the accumulation of honey, and the smaller ones for rearing queens. From the log hives we drew our supplies of bees in larger or smaller quantities, according to circumstances, to form colonies which were either sent off immediately or placed temporarily in movable comb hives. We also formed a great number of artificial colonies for queen-raising in small nucleus hives. For these the colonies from which the queens sold were taken, furnished the bees, old log hives supplied the combs and brood, and stocks previously deprived of their queens provided the royal cells.

Pasturage being abundant, the log hives from which swarm had been expelled, or which had swarmed naturally, sent forth second swarms in due time. The larger of these were placed in boxes (medium sized) made of thin boards, and speedily became excellent store stocks. The smaller were placed in movable comb hives, and used for rearing queens.

By the beginning of June all the queens of the previous year had been sent off to supply orders, and swarming was, for the most part, over. The queenless log hives were now broken up and the others duly pruned; and at the same time the large movable comb stocks, now again provided with fertile queens, were properly arranged for the storing of honey—strengthening them where necessary with brood from other hives, and limiting the brooding space by the insertion of dividing boards. Thus prepared, they were next transported to some of the higher Alpine villages where the season of pasturage did not open till the middle of June. In a few weeks they were filled with the most delicious honey, transparent and highly aromatic. So abundantly was it gathered that we were able to remove surplus boxes frequently, and numerous fine combs from the body of the hives. Pasturage continued to abound till towards the end of July, when the weather in

those elevated districts became rough, and the honey yielded was of inferior quality, greatly discolored and ropy. We then at once removed our colonies once more to the valley below; removed the queens and nearly all the honey; used a large part of the bees to supply full stocks desired by customers abroad; made strong colonies of the remainder, to which queen cells were given; and in August they were carried to the buckwheat and heath districts. The smaller movable comb stocks, which had repeatedly been deprived of their queens in the course of the summer, were now so united as to form populous colonies, and carried likewise to the buckwheat districts. The log hive stocks, both young and old, even such as had been unqueened a second time in July, were uncommonly heavy, and made excellent store stocks.

Though we had largely multiplied colonies, and repeatedly divided the larger stocks, the sales had been so extensive that we had only about one hundred and fifty hives remaining in the fall. Professor Mona was thus constrained to purchase fresh supplies from the bee-keepers in the valley, and did this on so large a scale that we were able to winter nearly six hundred stocks, after supplying all the orders received late in the fall.

These annually repeated purchases cause an accumulation of the most variously constructed hives in our apiary. Here are log hives or gums, such as are met with in all parts of Germany; cubic boxes made of thick boards or thin, as chance may offer, rudely nailed together; wine casks and beer barrels, cut through at the bung, so that this constitutes a semi-circular entrance for the bees; hollow trunks or limbs of trees; cylindrical hives made of linden bark; and inverted tubs or bucket-shaped vessels made by the cooper—in short, receptacles of every imaginable shape, size, and material. All this is a matter of entire indifference to us, provided the hives or substitutes for hives contain young queens, plenty of bees, and an ample supply of honey. Nor need we feel much concerned to find them made of even the thinnest material, as the temperature here is exceedingly mild on the average in winter, the thermometer rarely falling to zero. Hence we readily make room for them at the side of our movable comb hives, for the strengthening of which they are, indeed, chiefly designed.

Early in spring the bees of some of the log hives containing irregularly built combs, are either sent off with the first ordered queens, or transferred to the movable comb hives. The others are reserved to yield one or two swarms; to supply us with one or more queens in the course of the summer, in case we need them; and occasionally to furnish surplus bees to reinforce other colonies. Besides which they yield us a quantity of honey, larger or smaller, in the fall—thus fully subserving their natural design. Of the other description of hives we make various other uses. Thus we place the stronger afterswarms in light, medium-sized box hives, to have them in readiness to be sent off to purchasers early in spring.

For rearing queens and securing the superior quality of mountain and Alpine honey, we use the movable comb hives, of which we have three forms, all of the same width—27 centimeters, namely. The larger class hives, which can receive twenty-four frames nineteen centimeters high, supply us with honey in the comb, and serve also to receive in the fall the contents of several nucleus hives, used for rearing queens. The second class, containing ten frames twenty-eight centimeters high, serve to accommodate temporarily colonies driven out of log hives and intended for transportation to supply orders. We also use them to supply surplus boxes with honey, having to that end perforated the tops with slits four lines wide to give the bees access to the surplus boxes. We have thus a brooding space which may be enlarged or diminished, according to circumstances, and a removable honey chamber. The surplus honey thus procured is always in demand, finding ready sale at fair prices. In addition to these we have a supply of small hives, fitted to receive six or eight frames nineteen centimeters high, which are used for rearing queens from May to September.

When making the above-mentioned purchases of hives in the neighborhood, I had an opportunity to observe how bee-keeping was conducted in other quarters, and to acquire a knowledge of the system pursued by the Tessinian cultivators, if their processes may be designated by that term. The owner sets his hives either in the balcony of his dwelling house or in some special structure, but invariably exposes their fronts to the scorching rays of the noonday sun, for he contends that thus only can swarms duly *ripen*. Thus placed, he subsequently leaves them without supervision or interference to the instincts of nature. At the swarming season he will examine the trees and bushes around, generally in the evening when returning from the field; and if he chances to espy a swarm clustered somewhere, he will manage to hold over it a hive internally besmeared with honey, and seek to drive the bees into it with smoke. If a swarm is discovered in the morning, the whole day is not unfrequently wasted in hiving the new acquisition! And why not? since this is all the trouble his bees give him! When a swarm is once hived and set on its stand, he gives himself no further concern about it. When he sees that the bees fly out and in, he is content, and has no idea of doing anything more for them. Still in saying so, I may be slightly wrong. When we come to buy some of his stocks, he will lift the *prime swarms*, because he gives them the preference as being store stocks, but as for the *contents*, he never gives them a thought. He knows that he saw the swarm hanging on the tree; he hived it himself, and long experience has taught him that prime swarms are invariably the best store stocks! Afterswarms, he will tell you, do not always prosper; and old stocks are apt to become a prey for worms. Hence these are not by him deemed fit for store stocks, or are to be used as such only in case of dire necessity. That the worms usually destroy only queenless colonies is a matter beyond his comprehension, who has never seen a queen! Of course these crude notions are no disadvantage to us, since

the result is that we always obtain young queens. Still, with all his ignorance in this respect, the poor bee-keeper does not fare so ill as might be supposed, since the Italian bees commonly supercede their old queens in due time, and rear young ones seasonably. Hence the destruction of stocks in consequence of the superannuation of queens, is not so common an occurrence with him as might be supposed.

In many districts peculiar prejudices prevail. Some refuse to sell their supernumerary stocks, conceiving that they would at the same time convey their *luck* to the purchaser. They prefer dooming them to the brimstone pit, and thus harvest the honey in a good or a bad condition as it may happen. But since Professor Mona has commenced buying bees here, superstitious notions and prejudices are beginning to give way, because a handful of francs is an argument agreeably persuasive and powerfully convincing. More generally prevalent is the persuasion that a swarm accidentally found or one obtained by barter, is more certain to prosper than one bought with money. Whether a *stolen* hive comes within the same category in their estimation, I am unable to say. Many, likewise, are under the impression that any wrong they do will react on their bees; and it is fairly presumable that those bee-keepers who cherish this faith, are not the worst class of citizens. It is furthermore the universal belief that when a bee-keeper dies, his hives will gradually go to destruction; and hence they are exchanged for others as soon as practicable or sold in hot haste. Of course these remarks apply only to peasants who keep bees; yet the clergy here and others, though free from these prejudices, know as little of bee culture as the rest of the population.

Whether it is owing to the abundance of pasturage and a propitious climate or to the hardiness and industry of the Italian bee, that this valuable insect has survived amid such general neglect, mismanagement and ignorance, is hard to decide, though doubtless something is to be attributed to each of these causes. Local circumstances, too, may exert a favorable influence.

Among innumerable other, larger or smaller, honey-yielding herbs, plants, trees and shrubs, white clover is specially to be noticed in the fields here in season. The steep hill-sides produce plenty of wild thyme and heather. The cultivated field furnish no supplies for the bees till towards the end of August, when the buckwheat, sown in the rye-stubbles in July, comes into blossom. Of special account, too, is the blossom of the chestnut tree, which grows on the hills on both sides of the valley to the height of 3,000 feet above the level of the sea. In fact nearly the entire valley likewise might be called a chestnut forest. On a level plain this would constitute only a transient source of supplies; but it is otherwise here. The mountains are steep and lofty, and beyond them are the Alps with their eternal snow. The result is that during the summer, vegetation advances slowly and gradually upwards from the valley. Thus in the spring the same species of plants bloom three weeks later at an elevation of 2,000 feet above than they do in the plain below, and are yet within reach of the bee's flight. Hay making begins earlier in the fields and meadows below, and flowers will again be blooming there, by the time the grass on the higher localities is fit for the scythe. We have this further advantage that the valley is narrow, not over half a mile wide. The bees can consequently resort to the pasturage on either side, while the sun is shining there—exploring the flowers and appropriating the nectar on the one side in the morning, and turning in the afternoon to an equally well supplied area on the other. The soil is everywhere sandy.

From what has been said, it is manifest that a fair amount of pasturage is found here all the summer; that every early issuing swarm, though small, can gather sufficient supplies for the winter, if placed in a suitable hive; and that from strong colonies a large surplus of honey may be confidently expected. The best evidence of this is furnished by the stocks of the peasantry. In the course of my perambulations last fall, I saw more than a thousand hives, and though the increase of stocks had been nearly threefold, the average yield was rarely under ten pounds per hive. The most of them were decidedly full of honey, there being hardly six square inches of empty combs visible near the entrance below. This, too, while the hives had stood exposed to the full heat of the sun, so that the melted wax from the combs had run down on the bottom board, closing the lower entrance, and constraining the bees to deposit their stores from above. In many places the industrious insects, wanting room within, had built combs between the hives. What could not be accomplished here by the proper use of the movable comb hive?

As regards the bees themselves, it were superfluous to speak further of their untiring industry, since it must be evident from what I have stated that they must labor as assidiously here in their native home, as they do wherever introduced abroad. In the absence, however, of common or black bees, we have no means of instituting a comparison; but their extraordinary activity and productiveness repeatedly astonished me last summer.

In Germany, I regarded the Italian bees as pertinacious robbers, and had occasion frequently to protect the common bees from their encroachments. But here it was very obvious that they paid great respect to each other's rights, and refrained from attempts to commit depredations on their neighbors. We have often, the same day, deprived of their queens one-half of the colonies in a large apiary; have kept at the side of my large and populous stocks, small or weak nucleus colonies rearing queens, most generally queenless, and scarcely strong enough to cover the brood combs; yet no attempt was ever made to rob them. At the end of September and the beginning of October, we had for a time more queenless bees than we could properly dispose of. We placed them temporarily in roomy hives, supplied them with the needful honey, and set them among our other strong stocks, where, though the weather continued warm, they guarded their stores, and no serious attacks were made on them till we were able to use them for strengthening other colonies.

The bees with us are of a brownish yellow color; lower down the valley they are chestnut brown; higher up the mountains they are brighter and more slender. All of them are more active in their movements, especially when flying, than the common black bee. At first view I could scarcely persuade myself that the bees of the mountain and those of the valley were the same. But when we transported a number of our stocks from the plains to the Alps, for the purpose of gathering the finer quality of honey there, and these in a short time began to produce brighter colored bees, and the queens also grew lighter hued, we became satisfied that climate and nutriment determined the difference of color; and since then I make no distinction between them. Whether there are any other bees on this side of the Alps, which could claim a preference over the Italians we have here, I am unable to say, but intend to procure queens and workers next summer from various parts of Upper Italy; and will then compare them and report the result.

Last winter Prof. Mona procured a number of stocks from Piedmont, and the lower section of Lago Maggiore, under the impression that the bees found there were handsomer and better. A minute comparison gave these results: the workers resembled ours very much in color, though perhaps somewhat less brown. In size and shape they were precisely like the common black bees; and so likewise in their entire movements and deportment. Of the queens some were beautifully bright, others very dark, and less slender than those native here. I do not doubt that these bees are just as industrious as those of Tessin, but am unable to say anything from actual observation, as we removed their queens early in spring, and inserted in them royal cells of our own stock. It is not likely that Prof. Mona will soon make another such experiment. Mr. Spinedi, of Mendrisio, also gives the Tessinian bees the preference decidedly over all others. He says these are much more slender and more agile than those of Lombardy and Piedmont, and he therefore prefers them.

Beyond the Alps the bright yellow bees and queens are justly preferred, because there the local causes that influence differences are unknown, and by their brilliance of color they are so readily distinguished from the common bees cultivated there.

Among the enemies of bees, the following are enumerated here: the swallow, the death's head moth, the large wood ant, the small red ant, the wax moth, and the bee louse. Of these, the wax moth is regarded as most to be dreaded, not unfrequently producing widespread devastations in the apiaries.

As the winter here is short and mild, with a dry atmosphere, dysentery occurs among bees only in damp localities on the northern side of the Alps and the higher hills, which are overshadowed by these eminences nearly all winter. We usually have a number of stocks in the villages there, as the pasturage is rich and of long continuance; but we always remove them in autumn to the sunny side of the hills.

Fortunately for us foul-brood is entirely unknown on this side of the Alps, so that we are safe in buying bees and honey when and where we please. A large number of the German bee-keepers appear to be already well aware of this fact, as they purchased honey freely here last fall, which it is understood was to be used in feeding weak colonies preparatory to wintering. The price of honey depends on the quality and color of the article. The finest Alpine honey sells at two francs per pound; fine mountain honey, as also such as is gathered on the Alps late in the season, sells at one franc and fifty centimes; ordinary mountain honey one franc; valley honey gathered early in spring eighty centimes; second quality valley honey sixty-five centimes; buckwheat and heath honey, expressed from the combs, forty centimes. Yellow wax of good quality sells at from two francs and twenty-five centimes to two francs and thirty centimes per pound.

E. UHLE.

FAIDO, CANTON TESSIN, DEC. 23, 1866.

[For the Bee Journal.]

IN answer to W. A. Flanders, page 190, April No. of the JOURNAL, I would say I have always considered the theory of the compression of the queen bee to lay worker eggs, to be correct. The cause of the egg in the queen cell being impregnated can be explained in this way; the compression is produced by the weight of the abdomen when eggs are laid in these *vertical* cells. I have long since believed that if we can get a queen to lay in drone cells while in a perpendicular position, that queens and workers could be produced from the eggs thus laid. This may perhaps be accomplished in one of the following modes. *First*, if a drone comb is placed in a strong swarm, containing little or no drone comb, in the height of the season, the queen may be induced to lay therein, and if the eggs are impregnated workers will hatch from them instead of drones. *Second*, by introducing a sheet of empty drone comb at the time of drone egg laying, and examining this every few hours during the first few days, the queen can be found supplying the comb with eggs. Now hold it in a horizontal position so that the cells she is supplying will be under. Mark the eggs laid while the comb is thus held, cut out that portion of the comb, and give it to a nucleus having no brood but this; and I have no doubt but queens can be reared from these eggs. Who will experiment on this? I will for one.

R. B. OLDT.

NEW BERLIN, PA.

ONE of the most ingenious feeding-troughs is a French invention. It is formed of about eight hundred small cylinders of thick cartridge paper, about two thirds of an inch in length, closely applied together, each standing on its end; thus forming a mass not unlike a piece of honeycomb itself. The food being poured into a tin saucer, this artificial comb is placed on it, and the bees are able to feed almost in their natural state.

[For the American Bee Journal.]

Various Items.

DAMAGE FROM MICE.

I was greatly troubled by mice in my bee-cellar last winter. Though keeping a trap set all the time, I caught no more than three mice. They preferred honey and bees to the bait.

On placing my hives on their summer stands, I found a number of combs almost destroyed by mice, and found three dead ones in one hive. One day I returned a colony into the cellar, and forgot to replace the honey board after examination Next morning I heard some rattling in the combs, while trying to put on the honey board. I looked closer, and found that the rattling proceeded from a mouse. I took out three or four combs, and to my greatest surprise, found four mice near the cluster of the bees. I killed one of them with a stick, and caught another by its tail. To ascertain whether the bees would kill this mouse if brought within their reach, I held her directly over the cluster. Two bees immediately crawled on the mouse, which curling round a little, seized each of them and devoured both. But a third bee had meanwhile crawled on the mouse and gave her a sting, from the effects of which she soon died.

Formerly, I was of opinion that mice devoured dead bees only, eating honey and spoiling the combs. But I am now of opinion that they eat living bees also, and probably sometimes destroy a colony; though I have never yet had a colony destroyed by them.

DELAYED FECUNDATION.

Two years ago, I found the first young fertile queens on the 5th of May; and last spring on the 7th of May. This spring out of twenty-seven queens, only two were laying yesterday, (May 20th.) All but five were either lost, or killed by the bees One of them I had taken away from her colony which had enclosed her; but the bees would not feed her in the cage, though placed in the centre of the hive.

This delayed fecundation results, in my opinion, from the long-continued cold weather. At no time was the thermometer more than 14° R. above zero in the shade. I have had thousands of drones in my apiary, for about two weeks past, and about fifty of them as early as the first of April.

The present spring is the latest and coldest I experienced in this country in eighteen years. To-day (May 21st) not an apple tree is in blossom, and it will require at least one week more to bring them into full bloom. Bees have been gathering pollen to any extent only during three days and a half this spring, and honey during two days only. An immense number of colonies have starved or perished from other causes. One man lost fourteen out of fifteen, and another fifty out of eighty-four. A great number of bee keepers have lost all theirs. As for myself, I lost some stocks too but only a small number compared with the number I wintered,—twenty-three out of four hundred and forty-one. I will not deny, however, that a large number of my hives are weaker than I have ever had them before.

A SINGULAR OCCURRENCE.

I had a valuable queen in a weak colony, and removed her to another, strong but queenless. On examination five days afterwards, two unsealed queen cells were found. To mark the time when these cells would be sealed, I made another examination two days later; but to my surprise both queen cells were destroyed. Examining more closely I found a fertile Italian queen, but it was not the one I had removed before. On the preceding day, a weak colony had deserted its hive in my absence. The queen found belonged to this colony. The hives stood several rods apart. How did the queen know that this hive was queenless? And why did the bees not kill her, as they had both brood and queen cells?

I observed another very singular occurrence last spring. One day early in May, I had two colonies desert their hives. One of them had a good half bred Italian queen; the other a common black one—the only one I had in the apiary. About a week after this, I examined a stock of Italians which had a valuable queen, but could not find her. Three days later I re-examined the hive, and found lots of eggs, but no Italian queen I examined all the combs over again, and to my chagrin found a small black queen. How she came there and was successfully established in the colony is to me a mystery yet. But something more puzzled me. Four weeks after the swarming out of the black colony, I noticed young black and Italian workers play out of this hive, and the stock rapidly changed into a hybrid. The queen of the hybrid colony must therefore have successfully entered the hive of the black colony.

A. GRIMM.

JEFFERSON, WIS., MAY 21, 1867.

[For the American Bee Journal]

Two Mishaps.

Four years ago in July, I discovered a swarm of bees leaving the hive. They had been hived the day before. I closed the entrance, raised the hive a trifle, holes in the top of the hive open, honey boxes removed, cap covering the boxes on the hive. Other swarms issuing kept me occupied for an hour and a half, when on looking at them I found them all dead. There was not a dozen live bees in the hive. About noon one day last June, I put about a quart of bees in an empty hive; put on a queen-rearing box, letting the bees enter it; hole in the top of the box two inches square, covered with wire cloth. At night two-thirds of them were dead.

In my ignorance of bees and their management, I had always supposed, until since reading Mr. Adair's statements in the February Number of the JOURNAL, that they were smothered. If Mr. Adair, or any of the numerous readers of the JOURNAL, can give me any other satisfactory reason for the loss, I should be glad to hear from them.

A WOLVERINE BEE KEEPER.

For the American Bee Journal.

Introducing Queens.

FRIEND BEE JOURNAL:—With your permission I propose saying a few words on the introduction of queens. As this subject, in view of the efforts now making to establish the Italian race of bees in our country, is a matter of prime importance to bee-keepers, it is essential that the principles on which the operation can be safely conducted, should be fully discussed, in order to be correctly understood.

So far as I am acquainted with the facts, those giving us a *way*, rarely give us a *reason* for their success, that the novice may know on what principles to conduct the operation. Hence my object in this article is not to tell of some other way to do this thing, for all that can be asked is that the *process* should be *short* and the *result* CERTAIN. I simply wish to show *why* the methods already given are successful, or *why* they are not.

If I correctly comprehend the subject, all the methods thus far practiced are based on one or the other of two important facts in the natural history of the bees—facts which should never be lost sight of for a moment, by those having this thing in hand. The first of these facts, and the one generally acted upon, so that the *deprivation of a queen* creates an abnormal condition of the colony bereaved, appealing directly to the law of self-preservation, which causes the bees to accept an offered remedy, on the principle that "drowning men cling to straws." Hence if the operator conduct the matter on the conditions of bereavement, he must either practice some method like that given by Knauff or Mr. Gallup, which takes advantage of the *first excitement* caused by deprivation; or delay the case until the bees are made conscious of their *inability* to rear a queen, and the *abnormal* state is fully established.

The second fact to be taken advantage of, is the one so happily hit upon by Mr. Allen's plan. It is, that bees have no means of *recognition*, except through the *sense of smell*. I am fully satisfied that a colony of bees in a *normal condition* will never accept of a strange queen under *any circumstances*, except through *mistaken identity*.

Hence Mr. Allen's plan of smoking the bees with tobacco, and removing the queen without their knowledge, would seem to present as favorable circumstances for *practicing deception* upon them as could well exist. The bees and queen are made of the same scent by this plan, which if *properly* conducted leaves no *possible chance* for the bees to detect the cheat.

Thus we have presented the two methods of introduction. The first embracing all those which make the *recognition of queenlessness*, by the bees, an ultimatum of success, and consequently a matter of *choice* with the bees; and the second relying on the completeness of a deception.

I have never tried Mr. Allen's plan, but am disposed to regard it as the best yet presented—both in regard to *shortness* and *completeness*. It not only makes all of the *same scent*, but also *subdues the anger* of the bees; which is a very important matter. That many queens are lost by arousing the anger of the bees in the act of introducing a queen, and then leaving them to wreak their vengeance on the first thing that comes in their way, is a matter too little heeded.

If bees show a disposition to *sting* when a queen is being introduced by any of the methods adopted, the bees should at once be thoroughly subdued by smoke.

I have on two occasions had a queen killed by her own bees, just because I had *aroused their anger*, and left them to hunt a new object of spite. The facts satisfies me that the bees when angry, are not above *human nature*, but sometimes do that under such excitement which they would never do under other circumstances.

For this reason I would say to all introducing queens, never trust any one to the "embrace" of an angry colony of bees. Force them to yield by some means, and then you are safe.

G. A. WRIGHT.

OSAGE, IOWA.

[For the American Bee Journal.]

Introducing Italian Queens.

EDITOR BEE JOURNAL:—There are several methods given for the safe introduction of Italian queens, neither of which is always successful. The one recommended requires that the native or black queen to be removed six or eight days before the Italian is introduced. This method also requires that the stock be examined once or more, and all queen cells cut out or destroyed, making considerable trouble and delay, and keeping your stock of bees without a laying queen for several days. All other plans which I have seen published, are alike faulty. It would be very desirable to the bee-keeper to be able on the same day he receives his Italian queen to introduce her at once, without any risk of her being destroyed. Believing that I have discovered such a method, I will give it to my bee-keeping friends, after having, I think, fairly tested it. When I wish to introduce an Italian queen, if the stock is in a movable comb hive, I at once search for and remove the native queen. I then drive all the bees into an old box hive, or some other convenient box; or otherwise brush them off the combs any way to get them out of the hive into the box. As soon as I have done this, I take the hive and place it on the swarming table, and shake the bees out of the box, letting them run into their hive again, the same as if I were putting in a swarm. And when they are going in, I let out my Italian queen among them. She runs in with the rest, and is at once accepted. I have never known it to fail.

J. H. THOMAS.

BROOKLIN, CANADA WEST.

SEASONS, situations, and the laws of nature, present influences which may be guarded against or assisted, but which cannot be completely controlled.

Combining Systems.

BY DZIERZON.

Experience has shown that neither the swarming nor the magazine system of bee culture can be universally adopted and pursued to the exclusion of the other. The nature, extent, and duration of the pasturage will usually determine which system is to be preferred, or in what degree the two may be advantageously combined.

The swarming system will be found profitable only in districts of country where the pasturage, though never superabundant, comes in early, is always moderately full, diversified and of long continuance; and where the fall supplies are of a similar character. In such situations, early swarms will be able to fill their hives with combs, and store them with honey enough for the ensuing winter, whilst the parent stocks can gather honey enough for their own wants, with a satisfactory surplus for their owner; and the young prolific queens can speedily replenish the population of the hive. There a stock thus divided into two or more colonies, will increase rapidly, and present a much larger force for the ingathering of the harvest, than if it had remained in one united body dependent on the diminishing vigor of the old queen.

But where the pasturage, however plentiful, is of short duration, is made up almost wholly of the blossoms of a single species of plants, and terminates suddenly and entirely with the withering of these; and where moreover no fall supplies are to be looked for, it is always advisable to adopt and adhere to the magazine system. Enlarged room may then be provided for the bees in season to enable them to store up the honey so transiently within their reach; and it will be found better to secure an increase of stock later in the season by artificial multiplication than to allow the bees to waste precious time in preparations for swarming, while they should be engaged in honey-gathering. Even if swarming be allowed, under such circumstances, it results only in depopulating and weakening the parent stocks, and the young swarms will spend the honey they gather in building combs which cannot afterwards be filled, and starvation not unfrequently overtakes them even before winter sets in.

Yet there are sections of country where, though the swarming system is preferable on the whole, the seasons are sometimes of such a character that the magazine system would be profitable. Thus, after the swarms have issued, the weather in the latter part of summer and in the whole of the fall, may be such, in some years, that supplies of pasturage are almost wholly cut off, and both parent stock and swarms are so poorly furnished that they will die of hunger or must be carried over winter at much cost by regular feeding. Whereas, magazine hives would, under the same circumstances, have secured enough at least to carry them safely forward to the ensuing spring. Or it may happen in some years that there is a superabundance of honey in the spring, though the bees do not swarm, anxiously as such secession is looked for, and when finally the bee-keeper abandons all expectation thereof and supplies the bees with surplus honey receptacles, it is usually too late to be of much avail. Had no delay been permitted, a fine harvest of honey might meanwhile have been secured.

It is hence obvious that it will be advantageous not to adhere doggedly to either system, but so to arrange matters that either may be resorted to, as locality or season may render desirable, and to modify our procedures accordingly.

My hives and my method of managing bees are adapted to the requirements of either system, though in practice, I prefer on the whole, making artificial colonies to swarming. As my hives are close and warm, they are well suited to foster the production of natural swarms, when from any reason that is regarded as desirable. At the same time they are better adapted to the magazine system than any others. Still, I do not consider it advisable that bee-keepers residing in districts where straw or box hives are in common use should suddenly cast them aside, and substitute for them the movable comb hive. The latter are superior only when in the hands of an intelligent operator, who makes them the subject of study and attention. He must know *how* to use them, and actually use them properly in practice, or they will be of no more value to him than those made of a hollow log, if not actually inferior. Let a bee-keeper who is accustomed to the old fashioned hives, and uses them in the ordinary mode, retain them in his apiary, and attend to them with his usual diligence and care. He will then be safe, so far as bee-keeping on the old plan can give any assurance of safety. But let him also introduce a few movable comb hives that he may gradually learn how they are to be used, and proceed to add to their number, as he becomes aware of the superior facilities they present, and familiar with the manipulations requisite to make those facilities available. Valuable results will assuredly be realized in this way, because while learning the proper management of the new kind of hive, he will unquestionably become better qualified to manage bees even on the old system and in old-fashioned hives.

Where movable comb-hives are used, even on the non-swarming principle, in an apiary in which most of the colonies are still kept in common hives, they furnish the means of building up weak swarms, issuing from the latter so late in the season that they could not procure supplies for the winter. Such late swarms may be put in movable comb hives, and then aided and strengthened with brood and honey from like hives, and soon brought to a condition enabling them to winter safely. And again, when a season unpropitious for swarming occurs, because from a superabundance of honey stored up from early spring pasturage, the brooding space has become unduly contracted, bees kept in common hives would produce no increase by swarms, and there would be a small yield of honey in the fall, for the bees would use it freely for the production of brood when the gathering season was over, and empty cells enabled the queen to recommence laying eggs.

In such seasons and circumstances, it is a decided advantage to have both kind of hives in an apiary, because room can be furnished in movable comb hives for a continuous storage of honey by removing full combs, and either replacing them with empty ones or permitting the bees to build new. Artificial colonies too may be made in such seasons by taking brood and queen cells or queens from movable comb hives, and the bees needed to populate them from the colonies in common hives, and where they are hanging out in idle clusters. When taking honey from the movable comb hives in autumn and reducing stock, instead of brimstoning the bees, these may be united with those in the common box or straw hives, and thus saved with mutual advantage.

I have thus indicated a few of the reasons why the introduction of movable comb hives should, in most cases, be a gradual process, while retaining the common kind in the apiary, and shown also that swarming and non-swarming systems do not necessarily exclude each other, but may be rendered very serviceable when used in combination.

Mead.

Prior to the introduction of agriculture into Britian, mead was the principal cordial beverage of its inhabitants. Matthias de Lobel, M. D. calls it Cambricus potus. In other northern nations also it was formerly in high estimation.* This must have proceeded, either from their unpampered simplicity of taste, from their lack of other cordials, or from their having a better method of making their mead than has been handed down to posterity; for certainly in the present day it is a liquor seldom made, and holding a very humble rank among our imperfect vinous productions. It however continued in favor long after the introduction of malt liquor, and the northern inhabitants of Europe drank it generally until very modern times; and even in England, so late as the days of Dryden, it seems to have been better known than it is now, being sometimes used to soften or dilute strong wines.

"T' allay the strength and hardness of the wine,
Let with old Bacchus new Methegiin join."

To show how highly it was formerly esteemed in this country, I will give an extract from an ancient law of the principality of Wales, where "the praises of it, accompanied by the lyre, resounded through the spacious halls of her princes." "There are three things in court which must be communicated to the king, before they are made known to any other person:—

"1st, Every sentence of the judge.
2d, Every new song; and
3d, Every cask of mead."

Mead making seems to have been regarded by our forefathers as a high and important avocation; at the courts of the Princes of Wales, the mead maker was the eleventh person in dignity, and took place of the physician. We read in the English history, that Ethelstân a, subordinate King of Kent, in the tenth century, on paying a visit to his relation Ethelfleda, felt very much delighted that there was no deficiency of mead. According to the custom at royal feasts, it was served up in cut horns and other vessels of various sizes. About the same period, it was customary to allow the monks a sextarium (about a pint) of mead, between six of them at dinner, and half the quantity at supper.

Queen Elizabeth was so fond of mead as to have it made every year; her recipe for it will be found at the end of this chapter.

Bruce tells us that the Abyssinians still use it as their common beverage. They ferment it with a small quantity of parched barley-meal, and take off its luscious taste by the addition of a few chips of Surdo wood. With the same intention the juice of the mountain-ash berry is fermented with it in some parts of Wales. Probably, says Mr. Knight, the barbarous inhabitants of Europe formerly acidulated *their* mead with it.

'Poculo laecti
Fermento, atque acidis imitantur Vitea sorbis.

According to Feburier, though mead is much despised in France, when presented as mead, yet it is much used there under fictitious names, such as wine of Rota, of Medeira. of Malvoisin (Malmsley), and of Spain.

It was probably the liquor called by Ossian, the joy and strength of shells, with which his heroes were so much delighted; the Caledonian drinking-vessels having consisted of large shells, which are still used by their posterity in some parts of the Highlands. Mention is sometimes made also of the Feast of Shells.

Mead was the ideal nectar of the Scandinavian nations, which they expected to quaff in heaven out of the skulls of their enemies; and as may reasonably be supposed, the liquor which they exalted thus highly in their *imaginary celestial banquets*, was not forgotten at those which they *really* indulged in *upon earth*. Hence may be inferred the great attention which must have been paid to the culture of the bee in those days, or there could not have been an adequate supply of honey for the production of mead, to satisfy the demand of such thirsty tribes. In further confirmation of this attention, it may be observed that in France the ancient Barons drew a considerable revenue from the tax upon bee-hives; and they were among the articles of which a return was made at the doomsday survey.

The mythology of Scandinavia, (the religion of our Gothic ancestors) was imparted by Sigge or Odin, a chieftain who migrated from Scythia with the whole of his tribe, and subdued either by arms or arts the northern parts of Europe. From him descended Alaric and Attila. In the singular paradise which Odin sketched for his followers, the principal pleasure was to be derived from war and carnage; after the daily enjoyment of which, they were to sit down to a feast of boar's flesh and mead. The mead was to be handed to them in the skulls of their enemies, by virgins somewhat resembling the houri of the Mahometan paradise, and plentiful draughts were to be taken, until intoxication should crown their felicity. Hence the Poet Penrose thus commences his "Carousal of Odin."

* "Hydromel Borealibus, quibus vino desunt, pro vino est."—De Loebel.

"Fill the honey'd beverage high,
Fill the skulls, 'tis Odin's cry!
Heard ye not the powerful call,
Thundering through the vaulted hall?
Fill the meath and spread the board,
Vassals of the grisly lord!—
The Feast begins, the skull goes round,
Laughter shouts—the shouts resound!"

Hence, likewise in an ode by Mr. Stirling, we find the following illustration of the northern Elysium.

"Their banquet is the mighty chine
Exhaustless, the stupendous boar;
Virgins of immortal line
Present the goblet foaming o'er:
Of heroes' skulls the goblet made
With figured deaths and snakes of gold inlaid."

Boar's flesh was considered by these tribes as the highest delicacy; the celestial boar was supposed to be daily renewed, and to afford an ample repast for the most numerous party: a quantity of mead also, sufficient for the intoxication of this paradisiacal community, was imagined to be daily supplied by a goat called Heidrunn

"Whose spacious horn would fill the bowl
That raised to rapture Odin's soul;
And ever drinking, ever dry—
Still the copious stream supply."*

I could not refrain from adducing these short historical and poetical evidences of the high estimation in which mead was held by our northern ancestors. I trust that I shall also stand excused for still further lengthening my preamble by entering upon *the general principles of wine-making.*

The grand desiderata in wine are strength, flavor, and pleasantness:—to accomplish the first, sugar must be converted by fermentation into alcohol; the second depends upon the article to be vinified, and upon the management of the process of vinification; flavor may likewise be produced artificially by different adjuncts: pleasantness will principally result from the same causes, but more especially from the liquor holding in solution a certain quantity of unconverted sugar.

The elements necessary to a due fermentation and to bring the process to a satisfactory issue, *are sugar, extractive matter, acid of tartar and water* These exist in the highest perfection and in the best relative proportions in *the grape:* hence the superiority of foreign wines. Whoever therefore expects to imitate with much effect, those generous liquors, must supply in the process, those ingredients in which the article sought to be converted into wine is deficient.

If the native juices of fruits be deficient in sugar, it will be impossible to convert them into a strong wine without a proper supply of that ingredient; and without a sufficiency of extractive matter, which is the natural ferment, a due fermentation could not be established; the wine would be sweet but not potent; *sweet wines being the produce of an incomplete fermentation.* If the extractive matter were in excess, the liquor would have a tendency to the acetous fermentation, which might also be induced by a superabundant proportion of water.

*Considering the moderately intoxicating power of mead, it may be presumed that no inconsiderable quantity was required at these jovial banquets, as it is calculated to contain only seven parts of alcohol in a hundred.

The result of a complete fermentation is a dry wine; and to produce which, the elements must be nicely balanced, and the process conducted under favorable circumstances, with respect to temperature, tunning, stopping down, &c.

Two opposite practices prevail, in the manufacture of the same sort of wine; *some wine-makers boiling the juice before fermentation, others conducting the whole process without boiling.* The propriety or impropriety of these practices depends upon the quality of the juices to be vinified. Extractive matter is partially coagulable by heat; boiling therefore, by causing this matter to separate and to be deposited, tends to the production of a sweet wine. The extractive matter may also be precipitated by sulphuric acid gas, (burning in the cask a brimstone match as hereafter directed,) or by sulphuric acid itself, with which the soluble leaven forms an insoluble compound. Hence where the extractive matter is in excess, and where there is danger of fermentation going on too rapidly, boiling or sulphuring will be useful both to the wine and cider-maker, in checking or preventing fermentation. The superfluous extract thrown up in the course of fermentation as yeast, or deposited as lees, will, if remixed with the liquor, have the effect of continuing the fermentation: hence the utility of racking and fining, where it is in excess; and of reunion, where it is deficient. *Artificial leaven or yeast*, which contains the extractive principle in great abundance, affords a supply to those juices which are deficient in it, and without which they will not ferment. *Natural leaven*, (i. e *extractive matter*) is soluble in cold water, artificial leaven is not: during fermentation, therefore, the latter is always thrown off: so also is the greater part of the former, if the process be well conducted.

Most of the fruits of this country abound in *malic acid;* those that possess only a moderate quantity of it, however, afford excellent wine with the addition of sugar only; still better wine may be obtained by the further addition of the acid of tartar. Where the malic acid prevails so abundantly as to make its neutralization desirable, Dr. M'Culloch, (to whom I am indebted for much of the information contained in this chapter,) recommends coating the insides of the fermenting vats with a white wash of *caustic lime.* I have neutralized the malic acid, by putting into the cask, after the sensible fermentation has been completed, about a pound of *egg shells* to every sixty gallons of wine.

The acid of tartar increases the fermenting power of fluids: half-ripe fruits possess it in the greatest abundance; hence the vivacity of champagne and green gooseberry wine. It is most conveniently used in the state of supertartrate of potash or common cream of tartar; the common rough tartar is in some respects preferable, as its admixture of yeast assists in perfecting the fermentation.

All vegetables contain more or less of extractive matter; those that possess little may be assisted in their fermentation by that process being conducted in wooden vessels, wood sup-

plying the extractive principle to the liquor; the same juices, therefore, which would ferment very well in wood would scarcely ferment at all in glass or earthenware.

The extractive matter and the sugar are seldom completely destroyed in any wines; the existence of the former is evinced by the skinny matter frequently deposited upon the inside of the wine bottles; the latter may be detected by a nice palate, in the very driest of our wines; its predominance indicates an inferior wine.

From the preceding observations, my readers have probably anticipated my opinion of *honey in wine-making*. I regard it merely as a *substitute for sugar*; and to those who approve of its flavor I recommend the following *directions*, which I have successfully followed for several years, having my home-made wines enriched with a considerable portion of foreign flavor: Dissolve an ounce of cream of tartar in five gallons of boiling water; pour the solution off clear upon twenty pounds of fine honey, boil them together, and remove the scum as it rises. Toward the end of the boiling add an ounce of fine hops; about ten minutes afterwards put the liquor in a tub to cool; when reduced to the temperature of 70° or 80° of Fahrenheit, according to the season, add a slice of bread toasted and smeared over with a very little yeast; the smaller the quantity the bettre, for *yeast invariably spoils the flavor of wines*, and where there is a sufficiency of extractive matter in the ingredients employed, it should never be introduced: if fermented in wooden vessels, none is required. The liquor should now stand in a warm room, and be stirred occasionally. As soon as it *begins* to carry a head it should be tunned, and the cask filled up from time to time from the reserve, till the fermentation has nearly subsided. It should now be bunged down, leaving open a small peg-hole; in a few days this may also be closed, and in about twelve months the wine will be fit to bottle.

The ancients were accustomed to boil their mead for a considerable time, until the liquor would buoy up a fresh egg, allowing it to rise above the surface, about the size of a shilling, the criterion by whiah they judged that the process of boiling might be discontinued.

Many makers of both wine and cider have been unconsciously benefited from the acquisition of tartar by their liquor, it being a frequent practice to tun into an empty foreign wine-cask, whose incrusted sides have supplied their wine or their cider with a portion of that necessary ingredient for perfect vinification.

It is a practice with some to add spices to their mead during the fermentation, such as ginger, cloves, mace, rosemary, lemon-peel, &c. This is bad economy; a much smaller quantity will communicate the required flavor if the addition be made after the fermentation has ceased.

A *common beverage* is sometimes made, by simply washing the refuse honey-combs in water, after extracting from them as much of the honey as will run, and then boiling it for a few minutes: this liquor will not require tartar or yeast: it should be tunned as soon as cool, bunged down in three or four days, and drank in a few weeks. In some parts of Wales the refuse combs are brewed with malt, spices, &c., and the produce is called *Braggot*, a name derived from the old British words *brag* and *gots*, the former signifying *malt*, the latter *honeycomb*.

Simple hydromel is made either with honey which has become acid, or with honey and acidulated water; it is not fermented, but used extemporaneously as a summer beverage.

Feburier recommends one part of honey to be mixed with three parts of water, which he says will begin to ferment in about eighteen days, and throw off lees for six weeks or two months.

A knowledge of the principles of fermentation will enable the wine-maker to regulate its process. Thus, if a dry wine be desired, and fermentation be suspended, it may be renewed by a restoration of the separated leaven, or the addition of fresh; or by agitation, and a remixture of the lees. It is upon the latter principle, called "*feeding on the lees*," that some foreign wines are improved by long voyages; but this treatment, so *serviceable to Madeira and other Spanish wines*, and also to some of the French wines, *would destroy Burgundy*; the high aroma for which this wine is so much prized being obtained at the expense of some of its vinous attributes. If there be an excess of fermentation the scientific operator will regulate, check, or suspend it, by skimming, racking, fining. If skimming and racking do not succeed, recourse must be had to *fining*, which may be effected *by isinglass*, in the proportion of about an ounce to 100 gallons. The isinglass must be beaten, for a few days, with a whisk in a small quantity of the wine, till completely attenuated. This solution must then be well stirred into the cask of wine, which in about a week will become fine, and fit for being racked off. This fining is accomplished by the union of the isinglass with what is called the tannin of the wine. Fining may also be effected by *stumming*, i. e. *by burning in a close vessel, containing a small part of the wine, a brimstone rag*, at the rate of a drachm of sulphur to thirty gallons; and when consumed rolling the cask about for a quarter of an hour, that the wine may absorb as much as possible of the sulphuric acid gas. This being done, the cask is to be filled up with the remainder of the wine, and bunged down. In this process the sulphuric acid, or its oxygen, unites with the extractive matter or soluble leaven, which, being thereby rendered insoluble, is precipitated to the bottom, as I before observed. If wines be perfectly fermented, they do not require the addition of any brandy, as a sufficiency of spirit is generated during the process.

The best temperature for carrying on a fermentation is about 54° Fahrenheit. Its perfection depends in some degree upon the volume of the liquor; the larger the quantity, the longer the fermentation will continue, and the stronger and pleasanter will be the wine. There are, however, exceptions to this rule. The peculiar

excellence of champagne would be destroyed if its fermentation were conducted upon a large scale: it may be made successfully in a gallon measure. This wine is so managed by the makers as to ferment after bottling.

Dry wines and fine wines are much more durable than any others; and those that would perish in cask, *may be preserved many years by bottling.*

These hints will, I hope, enable the makers of home-made wines to conduct the process scientifically, and to secure generally a successful issue. Cookery books and good housewives abound in receipts for wine-making, which are very often fanciful and absurd, recommending the introduction of articles which, in their very natures, counteract the production of good wine. Hence we are sometimes presented with such miserable mawkish stuff, as disgraces the name of wine, being only rendered tolerable by the brandy which has been added to it, and which in some degree covers the crudeness and insipidity of the compound, and moderates its hostility to the peace of our stomachs.

Ancient Testimonies in favor of Mead.

Mead of the finest quality was called Metheglin, a name derived from two Greek words, signifying vinum splendidum: it was the produce of finer honey than Mead, and contained a greater proportion of it to the quantity of water. Metheglin was to Mead what Vinum was to Lora; what prime cider fit for bottling is to common draught cider.

So much was Mead esteemed in Transylvania that Merca or speaks thus of it: "Qui etiam rerum peritis, Vinum Creticum ceu Malvaticum opinantibus facile imponat."

"Lautiorum tantum mensarum sit, et primates solum bibant," says Ulysses Aldrovandus.

"Mulsum est vinum utilissimum et stomacho conven entissimum," Lobel and Pictorius.

Mulsum is stated by Dr Henderson to have been a mixture of wine and honey.

Age was considered as necessary to its excellence: "Vetus sit et rite confectum," says Andreas Mathiolus.

Queen Elizabeth's Recipe for Mead.

Take of sweet-briar leaves and thyme each one bushel, rosemary half a bushel, bay-leaves one peck. Seethe these ingredients in a furnace full of water; (containing probably not less than 120 gallons) boil for half an hour; pour the whole into a vat, and when cooled to a proper temperature, (about 75° Fahr.) strain Add to every six gallons of the strained liquor, a gallon of fine honey, and work the mixture together for half an hour. Repeat the stirring occasionally for two days; then boil the liquor afresh, skim it till it becomes clear, and return it to the vat to cool: when reduced to a proper temperature (about 80°!) pour it into a vessel from which fresh ale or beer has just been emptied: work it for three days, and tun.

When fit to be stopped down, tie up a bag of beaten cloves and mace, (about half an ounce of each) and suspend it in the liquor from the bung-hole. When it has stood for half a year it will be fit for use.—*Bevan on Bees.*

[From the Bienenzeitung.]

Another Exception.

Mr. Rothe stated in a recent communication to the *Bienenzeitung*, that he has observed an instance where a normal queen issued from a side-opening in a royal cell. Permit me to say that a similar exceptional case came under my notice last summer. I placed a queen cell nearly mature in a queen cage, intending that its inmate should there complete her development. On examining it a few days after, I found a young and apparently perfect queen moving about in the cage. The apex of the cell did not present the circular opening usually seen when the newly-hatched queen has emerged. It was still entire, and closed, but there was an opening on the side of the cells as if it had been made by workers in the usual manner, though none such could have had access to it, and through this side-opening the queen must have emerged. She subsequently, when liberated, made her hymenial excursion, and was duly fertilized.

DISTANT BEE PASTURAGE.

In the course of last summer I had an opportunity to observe the influence which the greater or less distance at which bee pasturage is found, exerts on the population of a hive. One of my apiaries was located at a place in the immediate vicinity of which there was literally nothing for the bees to gather. The apiary was completely surrounded with grain fields, encompassed by mulberry hedges, neither of which yielded honey. The few and small patches of meadow land in the neighborhood, were poor and marshy, with few flowers furnishing nectar. To obtain supplies sufficient for their subsistence, the bees were consequently constrained to fly to a considerable distance. Thus, for instance, I noticed about the middle of June that they were passing to and from a chestnut grove then in full blossom, and which was about three miles distant. The weather was warm and somewhat sultry. The queens laid an abundance of eggs, and the hives were full of brood. Nevertheless, when examining the hives at eve, after the day's toil was ended, I found only small supplies of honey and a scant population. At first, I was unable to account for this, because judging from the masses of brood seen in the hives, large numbers of young bees must have been issuing daily, and the stocks should consequently have been well filled with bees. On reflection, I became convinced that it was the distance to which the bees were constrained to fly to reach their pasturage, that caused the striking paucity of population—a large proportion of those which went forth in eager quest of honey perished on the way from various mishaps, and never returned to their native home.

I remember that when formerly expressing to older bee-keepers, my apprehensions that bees placed in certain localities would be unable to gather stores enough for their own subsistence, I was assured that I need give myself no concern about the result, because the bees

would make their way to great distances. Such is, no doubt, the fact, but when bees are thus compelled by sheer neces-ity to undertake distant excursions, they may possibly manage to "live along," but no profit can be realized from their labors. All the gratification which the bee-keeper can hope for in such localities, is the pleasure of seeing his industrious favorites flying out and in very busily, without accumulating a particle of surplus honey; and in unfavorable years he may have the mortification of seeing them perish from hunger, unless he considerately and seasonably makes provision for their wants.

DR. BLUMHOF.

[For the American Bee Journal.]

Questions and Answers.

Questions *intelligently* and *briefly* asked, and answers carefully made, based upon *actual experience*, will no doubt add very much to the life and interest of the BEE JOURNAL:

1. As regards straight combs, there can be no doubt but that bees have certain unaccountable vagaries. Langstroth's movable bars, on a level, *will not* ensure straight combs; neither will an elevation of 45° have the effect without failures occasionally. Guide frames are too troublesome and disturbing. The writer has found guide combs, or surplus combs from various hives, the surest way. *Every other* bar with a straight comb will ensure straightness in the others; but even then, sometimes, if the combs are not all complete, the lower part, or side, will be too thick, at the expense of its neighbors. Infallibility is *not yet* attained.

2. Eggs and brood of bees and moths can be destroyed by *freezing* in an ice house.

3. The third question is too indefinite. No short or easy road for a novice in bee-keeping. If by "dividing bees" is meant to separate a *swarm*, then even a novice, by noticing their behaviour, would soon see that where the queen is there will be comparative quietness and readiness to enter the hive prepared for them; while the others would soon take wing.

If a *hive* is meant or a number of bars, the presence of brood in each portion precludes any one plan by which "a person of ordinary intelligence need not search for the queen."

4 Nuclei carried beyond the ordinary flight (say two miles) would raise more queens than one full hive—that is, supposing they are separated.

5. The fifth is an echo of question No. 1, on page 165. Well, any one can *ask* questions, and the reason this one has not been replied to before is because, perhaps, the writer is less modest than his apiarian brethren. But we shall not presume to *answer*. (Who can?) We only reply.

Will it pay to cultivate any plant expressly for honey?

We can only say that the fact of keeping bees might very fairly be the turning point with a land-holder, whether he would put a certain field into buckwheat or white clover. Beyond this, it is doubtful if it would pay: even supposing he did not feed his neighbor's bees as well as his own.

Which plant is best?

White clover, most certainly.

How many acres would keep 100 colonies busy while in bloom?

One—on the principle that it is with *all* bees, as with *some* men: "keep what you get and get what you can."

How *many* days in average seasons, and *how long* each day, does it yield honey?

Give it up.

The other two questions are easily answered, supposing that clover (white) is the only available plant.

* * * * * * *

Now, Mr. Editor, I would like to ask one question. Have any of your readers ever tried *painting* the top of bars and the under part of the honey board—that is, in order to prevent the bees from building comb between?

APIS.

Burying Bees.

A bee-keeper in the vicinity of Hitchin, in England, buried a hive of bees, in the first week in November, about a foot deep, amongst dry leaves, &c., and disinterred it in the last week in February, when it was just *two pounds lighter than it was in November*, and the bees *in a lively and healthy condition*. Another person residing in Leicester, immured a hive of bees in the earth, four feet deep, in the second week in November, and at the end of January, it was removed, and weighed only *three ounces less than it did before it was buried*.

These experiments are worthy of further consideration. The principal points by which there might be cause for fear of failure, would, as in other cases, be from dampness, want of fresh air, access of vermin, &c. But these might be guarded against by a person of ordinary ingenuity. Still it would be imprudent for any one to risk the loss of an entire apiary by this mode of wintering, at least not until he had obtained knowledge and skill, by trials on a small scale.

WHEN, from any cause, or under any circumstances, it becomes necessary to feed bees, pure honey is much the best and most suitable food to give them. But if you have not a supply of honey at hand, and cannot procure it, you may form an excellent substitute by boiling ale and sugar together, gently, in a clean and well-tinned vessel, over a clear fire, for about five minutes. One pound and a half of sugar may be added to each quart of ale; the mixture to be skimmed as the scum rises to the surface during boiling. When the syrup is taken from the fire, add to it about a teaspoonful of common table-salt for each quart of syrup.

SOME people defer feeding until the bees are absolutely in want. This is very wrong. The assistance should be rendered several weeks before the hive is in a state of positive destitution, otherwise, when you feed, the bees will be too weak to avail themselves of your bounty.

An Inquiry into the Source and Nature of Bees-Wax.

Till within these few years it was very generally and implicitly believed, that the yellow matter (in other words, the pollen or farina of flowers,) which bees visibly collect on their thighs, is the prime constituent of wax, the material of the honey-comb. Even Swammerdam, Reaumur and Bonnet were of this opinion. Butler, Purchas, Resden and Thorley argued against its identity with wax; and I trust that the observations and experiments which I am about to detail, will convince the dispassionate inquirer of the fallacy of this old opinion.

In the first place, it is to be observed, that where no more comb can be built, as in old hives, the bees carry in the greatest quantity of this yellow matter.

Secondly, That it differs materially from wax, the latter when examined between the fingers being adhesive, the former crumbly; the latter also liquifying on the application of heat, whilst the former burns to ashes.

Thirdly, That the wax of new combs, from whatever source collected, is uniformly white; whereas, the farina, as gathered by the bees, varies in color, being generally yellow or red, agreeing in color with the anther dust of the flowers in blossom at the time of its collection. Moreover, the farina after it has been stored in the cells, retains its original color; whilst wax, after its residence in the hives, invariably changes, first to a yellow, and lastly to a dark brown. Layers of different-colored farina are generally found in the cells, if slit down; and every hive, at the season of deprivation, possesses a store of it.

Fourthly, That fresh colonies carry in very little, if any, of this matter, for some days after swarming, though combs are formed within that period. I noticed this fact in my first colony: the swarm issued from the parent hive on the 18th of May—five days of rainy weather succeeded; during this period the bees were prevented from flying abroad; I fed them nightly with sugared ale, and before the return of fine weather a considerable quantity of comb was formed Now excepting such materials as the bees might have brought with them from the parent hive, in this case, the sugared ale alone must have been the source of the wax. Huish has remarked that unless bees have access to water, and also to sugar or honey, no comb can be formed. Again, it may be observed, that upon the storifying plan, when fresh works are commenced in the duplets or triplets, if the farina were the basis of the combs, an increased quantity should be carried in. On the contrary, though I have watched the bees very minutely on these occasions, I scarcely ever witnessed the introduction of farina; and in such rare instances as I did observe it, it might fairly be regarded as food for the young larvæ of the bees contained in the full box or boxes.

The observations of Mr. John Hunter tended to confirm this view of the matter; still more so, those of M. Huber and son. In order to determine the point with greater precision, Huber instituted many experiments. On the 24th of May he lodged a recent swarm in a straw hive leaving at its disposal only a sufficiency of honey and water for its consumption, and preventing it from going beyond the precincts of a room, so closed as to admit only a renewal of the air.* At the end of five days as many cakes of beautifully white, though very fragile, wax were suspended from the roof the honey had totally disappeared. Still, however, as there was a possibility that the thighs and stomachs of the bees might have conveyed pollen from the parent hive, he withdrew these five combs, and replaced the bees in the hive with a fresh supply of honey and water; they renewed their toil with unabated industry, and soon fabricated new combs: these last were taken from them; when the patient and indefatigable insects commenced a third structure of comb. Five times in succession were their works thus completed and removed, although during the whole of this period they were fed merely with honey and water, and could not possibly have had access to farina.

These experiments, so uniform in their results, give indubitable validity to the fact—that honey, through the organic intervention of bees, may be converted into wax. A contrary experiment was made, by abundantly supplying a hive with fruit and pollen only: but during eight days' confinement the bees produced no wax whatever, nor exhibited any plates under their abdominal rings; no combs were formed, nor was an atom of farina touched—a clear proof that farina supplies neither wax nor sustenance to adult bees. The improbability of this indeed is evinced by its abundance in hives whose tenants have died of famine. And as to its being the constituent of wax, Reaumur calculated that a well-stocked hive might collect at least 100 pounds of pollen in a season, whereas the weight of wax fabricated in the same time would not exceed two pounds.

Experiments have proved the excellence of sugar as a substitute for honey, and in some instances its superiority, for the formation of wax. It might otherwise have been supposed that bees might form comb from some particles of wax accidentally present in the honey, and that these afforded the pabulum for this secretion. To prove, therefore, that the saccharine principle alone enabled the bees to produce wax, being still confined, they were supplied with a syrup made with Canary-sugar and water, and at the same time comparative experiments were made in another hive, where the bees were fed on honey and water. The syrup-fed bees produced wax sooner and more abundantly than the honey-fed bees. Another fact was also incontrovertibly elicited; namely, that in the old hives the honey is warehoused, and that in the new ones it is consumed and trasmuted into wax.

The experiments of Huber have been confirmed by those of M. Blondelu, of Noyau, who addressed a memoir upon this subject to the Society of Agriculture at Paris, in May, 1812.

*To prevent the bees from being impatient, it was found necessary to conduct the experiment in a cool place, as well as to exclude the light.

Huish has critically examined these experiments of Huber, but without being convinced by them; for having observed pollen on the thighs of bees when swarming, and upon dissection, in their stomachs also, he considers that pollen, elaborated in the second stomach of the bee, "contains in itself the principle of wax" Were this the case what a store of pollen must the bees have reserved in Huber's experiments, wherein they formed five successive sets of comb, without access to fresh pollen! The pollen or bee-bread, which Huish discovered on the thighs and in the stomach of some of his bees, was most likely imported by such of them as being on the return home at the time their companions were swarming, joined the throng with that freight which was intended for larva-food in the hive. With this pollen (or ambrosia, as it has been called,) after conversion into a sort of whitish jelly by the action of the bee's stomach, where it is probably mixed with honey, and then regurgitated, the young brood, immediately upon their exclusion from the ova state and until their change into nymphs, are fed by the nursing-bees several times a day. The opinion that pollen is the prime constituent of wax was held by Buffon, and remains uncontradicted in an edition of his works so late as 1821. Arthur Doubs, Esq., in the Philosophical Transactions for 1752, instead of considering wax as digested pollen discharged from the stomach of the bee, regards it as being emitted *per anum;* and as he speaks of its discharge in husks or shells, doubtless he saw it in that form, which it is now known to assume when moulded upon the body of the bee. Indeed he says that he has had swarming bees alight upon his hand, and drop warm wax upon it. Its being secreted only by the under side of the belly might easily deceive, and lead him to regard it as alvine excrement. That minute and accurate observer Butler, though evidently not aware of the secretory process by which wax is generated, noticed that in fresh swarms, the bees came in without any pollen upon their thighs, and therefore supposed the mouth to be the vehicle for conveying it. "When they gather abundance of this stuff," (pollen) "they have never the more wax; when they make most wax, they gather none of this." Butler even remarked that old stocks gather much pollen, and fresh ones little; because the stocks have larvæ to feed, whilst the swarms have none.

I will here subjoin some more proofs of the nonidentity of wax and pollen. So long ago as 1768, the Lusatian Society (called *Societe des Abeilles*, founded at Little Bautzen, a village in Upper Lusatia, under the auspices of the Elector of Saxony,) knew that wax was not discharged from the mouths of bees, but was secreted in thin scales among their abdominal rings or segments. About 1774, Mr. Thorley caught a bee just entering its hive, and found, among the plaits of its belly, no less than six pieces or scales of solid wax, perfectly white and transparent, and he oftentimes saw wax in the same situation. M. Duchet, in his *Culture des Abeilles*, quoted by Wildman in 1778, declares that wax is formed of honey; and relates in proof of it, that he has seen a broken comb of an overset hive, which was repaired during bad weather, when the bees could not acquire any other material. This statement of Duchet corresponds with my own observation, heretofore made, but is not so conclusive. In Duchet's instance there might have been other materials in the hive besides honey; whereas in my case the bees had access to no materials whatever, excepting the sugared ale and the honey which they had conveyed from the parent hive, the swarm having been just hived. Butler and Wildman state their having seen pieces of wax like fish scales, on the hive floor of fresh swarmed colonies, part of which, at least, they both thought must have been formed upon the body of the bee; for though some flakes might have fallen from the combs then constructing, there were many pieces among them which were concave on one side and convex on the other, as if moulded on the insect's belly. Flakes were likewise seen hanging loose, between the abdominal scales of the bees. In 1792, Mr. John Hunter, apparently unacquainted with antecedent conjectures, detected the genuine reservoir of wax under the bee's belly. He considered wax as an external secretion of oil, formed and moulded between the abdominal scales of the insect. Dr. Evans confirms the testimony of Wildman and Hunter. "One or more bees," he remarks, "may be often seen before the door of the hive, supporting themselves by their two fore feet, fluttering their wings, and agitating the hind parts of their bodies. They are then evidently moulding the wax between their abdominal scales, the motion of the wings serving to preserve their balance, and as a signal for their companions within to come and carry off the falling flakes, to the formation of which he was an eye-witness."

To complete the evidence, however, to me so irresistible, in favor of the wax-secreting faculty of the bee's body, I observe finally, that in 1793, M. Huber's observations led him to the same conclusion as Mr. Hunter's, relative to the nature of the laminæ under the abdominal scales: but Huber slumbered not there; he prosecuted the inquiry more successfully than any preceding naturalist, and at length demonstrated the secreting organs which had eluded the scrutiny of Swammerdam, Hunter, and other acute anatomists. He found that these laminæ were contained in distinct receptacles, on each side of the middle process of the scales; he examined, with great care, the form and structure of these secreting cavities which are peculiar to working bees. Each working bee has eight of these organs, sacklets or small compartments. Their general shape is an irregular pentagon, and the plates of wax being moulded in them, exhibit accordingly the same form. A perforation of their lining membrane on the side next to the abdomen, started a jet of transparent fluid, which congealed on cooling; in this state it resembled wax, and became again fluid on the application of heat.

Comparative experiments were made with the substance contained in the pouches and with the wax of fresh combs; a great similarity between these two substances was discerned;

the latter appeared somewhat more compound, having probably received some additional ingredient, while employed as the material for building. The secreting function of the membrane on the inner surface of these cavities, was further evinced by a more minute examination of its structure, which exhibited a number of folds, forming an hexagonal network, analogous to the inner coat of the second stomach of ruminating quadrupeds. Huber does not appear to have known the observations either of Duchet or of Wildman on this subject, although they were made long prior to Mr. Hunter's; for he quotes only from the latter.

Whenever combs are wanted, bees fill their crops with honey, and retaining it in them, hang together in a cluster from the top of the hive, and remain apparently in a state of profound inactivity, about twenty-four hours. During this time, the wax is secreted, and may be seen in laminæ, under the abdominal scales, whence it is removed by the hind legs of the bee, and transferred to the fore legs; from them it is taken by the jaws, and after being masticated the fabrication of comb commences. In swarms it may, and sometimes does, commence immediately after hiving, thus affording evidence of preparation, and consequently of intention to swarm.

"To see the wax pockets in the hive bee, you must press the abdomen, so as to cause its distention; you will then find on each of the four intermediate ventral segments, separated by the carina or elevated central part, two trapeziform whitish pockets, of a soft membranaceous texture; on these the laminæ of wax are formed in different states, more or less perceptible."* Eight scales are thus produced at once, a pair under each ring, except the first and last, which are constituted differently from the rest. The size of the scale varies with the diameter of the rings, on which they are moulded; the largest being beneath the third, the smallest under the fifth ring.

"Non labor omnibus idem," says Vaniere. Messrs Huber and son have affirmed that the office of collecting honey, for the elaboration of wax, is filled by a particular description of bees or laborers, to which they have given the name of *wax-workers*. These bees are susceptible of an increase in size, as is evident from the state of their stomachs, when quite full of honey Dissection has shown that their stomachs are more capacious than those of the bees that are differently occupied. Bees not possessed of this expanding stomach, gather no more honey than is necessary to supply the immediate wants of themselves and their companions, with whom they readily share it; they seem formed for retirement, and are called *nursing bees*,† their duty being to rear the young, and attend to the internal economy of the hive. The task of storing with provisions devolves upon the wax-workers, who, when not occupied in the construction of comb, disgorge the honey into those cells which are intended for its reception. By marking the bees, it was found that they never encroached upon each other's employment; this strict adjustment of duty is the more remarkable, since the power of producing wax is common both to the nursing and wax working bees, a small quantity of wax having been actually found in the receptacles of the nursing bees. The difference between these bees had probably been observed both by Aristotle and Pliny. That such difference actually exists, is confirmed by the observations of Mr. Newport on humble bees; he witnessed their mode of raising the temperature of their domicile some hours before the perfect maturation of the brood, and found there was a successive change of nurses, as soon as the heat of those in attendance became lowered by perspiration.

In the foregoing experiments for ascertaining the sources of wax, the bees had borne their confinement without evincing the least impatience; but on another occasion, when shut up with a brood of eggs and larvæ, and without pollen, though honey was copiously supplied, they manifested uneasiness and rage at their imprisonment. Fearing the consequence of this state of tumult being prolonged, Huber allowed them to escape in the evening, when too late to collect provisions; the bees soon returned home. At the end of five days, during which this experiment was tried, the hive was examined: the larvæ had perished, and the jelly that surrounded them on their introduction into the hive had disappeared. The same bees were then supplied with fresh brood, together with some comb containing pollen; very different indeed was their behaviour with this outfit; they eagerly seized the pollen and conveyed it to the young; order and prosperity were re-established in the colony; the larvæ underwent the usual transformations; royal cells were completed and closed with wax, and the bees showed no desire to quit their habitation. These experiments afford indisputable evidence of the origin of wax, and the destination of pollen. Butler observed that there was a great increase in the members of the hive, after pollen was carried in, which he supposed rendered the queen prolific

Though the wax of honey and brood-comb is an original secretion from the body of the bee, wax is also considered by some as a vegetable substance existing abundantly in nature. According to Proust, it forms the silvery down on the leaves, flowers and fruit of many plants, and resides likewise in the feculæ of others.

Dr Darwin, in his *Phytologia*, supposes that wax is secreted to glaze over the fecundating dust of the anthers, and prevent its premature explosion from excessive moisture: to an unseasonable dispersion of anther-dust he ascribes the failure of orchard and corn crops in summers of extreme humidity. The wax tree of Louisiana. *Myrica cerifera*, contains immense quantities of wax. In this respect there appears an identity betwixt animal and vegetable secretion, which may be viewed as indicative of simplicity in the structure of the bee: a still simpler organization exists in the aphis, which extracts the saccharine juices from the

*Kirby and Spence.

†Later observations have shown there is really no such rigid division as wax-workers and nursing-bees, the different duties being performed by the same bees in different stages of their existence.

leaves and bark of trees, and expels them again nearly unchanged.—*Bevan.*

[From the Maine Farmer]

Popular Whims.

MESSRS. EDITORS:—You are men of sound judgment and if perfectly agreeable to you I would like to have the benefit of your opinion, in regard to some of the "whims" and peculiar ideas so prevalent among some classes of people, and particularly among farmers. Now, I will not insult your intelligence by asking if you believe in any such thing as "killing hogs," "planting peas," &c., on the "full of the moon," or that most absurd of all absurdities, putting an odd number of eggs under a hen so that she may be more successful in bringing forth her brood; but there is an idea in regard to bees that perhaps admits of an argument. It is said that bees will not do well when kept by a family where they have "broils," and also if any one of the family dies and the hive is not "dressed in mourning" the bees will leave. Now let me give a few cases that have come under my observation. A family—where they kept bees—was called to part with a loved one. The funeral ceremony was over and the procession started from the house, and had gone but a few rods when they saw the bees following them, they stopped, went and dressed the hive in mourning and the bees returned. Another case was this: A family received the sad news that their son was killed in battle. In a short time (I do not know the exact number of minutes) there was a stir among the bees, and they were preparing to leave. The hive was appropriately decked, and they resumed their labor perfectly contented. In another instance, a young man died. The funeral took place at the house, after which the body was carried away twenty-five or thirty miles, no procession following. No action was taken in regard to the bees, and strange to say, they did not suspend operations; and the reason assigned was that no procession was formed. In the same family, the husband died, and the bee-house was not decorated, and of course the bees refused to work. The wife went out near the hive and said, "your master is dead; now you must work for me." They immediately went to their work as busily as before.

Now, that these little creatures have a high degree of intellect, we do not doubt; while as to architecture they have a knowledge that a master workman might envy; yet I pray you tell me, how can they know whether a family is happy or not? We cannot surely charge them with being eavesdroppers—they are too industrious for that—and I hardly think they are possessed of the faculty of reading faces, and in that way find out the family affairs. Or can you believe that they know if I receive bad news? And can we suppose, that we may converse with them, or rather *to* them? What I have related are simple facts, and there is an air of mystery about it, that I cannot fathom; yet I do not, can not, believe the general idea in regard to them. Please give your opinion and oblige. C. B. M.

UPPER STILLWATER, MAY 27, 1867.

NOTE. 1—We have so often given our opinion concerning the so called influence of the moon upon vegetation, the boiling of meat, the decay or preservation of timber, &c., that it seems hardly worth while to repeat it. However, to satisfy our correspondent we will say briefly that we do not believe in any such influence. The light of the sun flashes ninety five millions of miles and strikes upon the moon, shining upon it equally all the time. A part of the time we upon this planet see the shade, and a part of the time the reflection of the sun's light. But why this faint shadow, more than two hundred thousand miles off has any more to do with the growth of pea vines, the shrinking of meat boiled in a pot, or the decay or preservation of timber, than the barking of a dog in China has on the churning of cream in Nova Scotia, we acknowledge ourselves too ignorant to perceive.

2—The superstitions regarding bees, are quite as familiar, and some of them seem certainly mysterious. Quinby in his book about bees has not a word to say about the matter though he could not have been ignorant of the reports of similar occurrences to those mentioned by our correspondent. Langstroth devotes half a page to what he terms supersititions about bees, mentioning a number of incidents like those just related by our correspondent. One of them is as follows: "A clergyman told me that he attended a funeral, where as soon as the coffin was brought from the house, the bees gathered upon it so as to excite much alarm. Some years after this occurrence, being engaged in varnishing a table, the bees alighted upon it in such numbers, as to convince him, that love of varnish, rather than sorrow or respect for the dead, was the occasion of their conduct at the funeral." We leave this matter at present, with the remark which Mr. Langstroth makes in his book, "The Hive and the Honey Bee," after relating the above instance: "How many superstitions, believed even by intelligent persons, might be easily explained, if it were possible to ascertain as fully all the facts connected with them!"—EDITORS MAINE FARMER.

A HIVE should contain at least twenty pounds of honey for its support during winter; but it is a mistake to suppose that an *increase of number* in the hive, produced by *union*, will require an increased supply of food. In fact, precisely the contrary is the case; and the more abundant the stock of bees in autumn, the richer and the better able to work will they be in the spring—the more forward, therefore, will they be in summer, and the greater will be your profits.—*Richardson.*

HONEY may be *clarified* by placing the vessels containing it in hot water, and continuing to skim as long as any scum arises. In order to preserve honey, it should be stored in jars, well bladdered and otherwise secured; and kept in a dry place.

THE AMERICAN BEE JOURNAL.

WASHINGTON, JULY, 1867.

☞ THE AMERICAN BEE JOURNAL is now published monthly, in the City of Washington, (D. C.,) at $2 per annum. All communications should be addressed to the Editor, at that place.

☞ THE third volume of the AMERICAN BEE JOURNAL, of which this is the first number, we are gratified to believe, commences under more favorable auspices than either of its predecessors. There have been considerable accessions to our subscription list within the last two weeks, and a warm interest manifested for the success and permanent establishment of the paper. This is encouraging, and shall be met by corresponding efforts on our part. We have arranged to receive an additional number of foreign periodicals and publications, and shall thus have increased facilities for furnishing our readers with early information of whatever improvements or advances in practical bee culture are made abroad.

IN an essay on "*American Fruit*" by Dr. Porsch, General Secretary of the Horticultural Society of Bavaria, published in the *Frauendorfer Blætter* in June, 1848, it is alleged that "the first hive of honey bees that was carried to North America, came from Germany." The authority on which this statement was made, is not given; but we shall endeavor to ascertain it.

Melilot Clover.

This plant is strongly recommended for bee pasturage, in this number of the BEE JOURNAL, by one of our correspondents; and the last number received of the *Bienenzeitung* contains a communication from Mr. F. Bahr, of Saxony, which gives it a high character, both as a honey-yielding and a forage plant. If it combines the two qualities it may receive favorable attention in this country from farmers residing where soil and climate are suited to its growth. It is not to be expected that any crop will be extensively cultivated here merely for bee-feeding purposes. In good soils, some substitute for red clover is needed, which, in addition to the nutritious and ameliorating properties of that crop, shall furnish supplies of honey available to the bee, and offer besides some special advantages which may cause it to be selected in preference. In some localities Alsike or Swedish clover, it is thought, will be found to answer this purpose. In others, perhaps, Melilot clover may prove available. In poorer lands and sandy districts, moreover, some plant is required which shall there supply the means of improving the soil, furnish forage for stock, and yield honey for the bees. In such districts in Germany, a plant called Serradella (*Ornithopus sativa*) has been introduced from Spain, and is successfully cultivated. There is much thin and sandy land in this country, especially along the seaboard of the Southern States, where this plant might prove to be, in all respects, a highly valuable acquisition.

For the American Bee Journal.

Bees, and Allen's New Patent Hive.

This is an age of utility and improvement, especially in material things. Contrasting the state of the world fifty years ago, with its present advanced position, we are struck by its rapid progress in the useful arts. Inventions of all kinds in every department of labor, inventions many of which greatly facilitate work and shorten the time of its performance, are the order of the day, and all the various branches of industry are constantly receiving new impetus and fresh acquisitions from increased mechanical skill. This is as it should be. Progress is a necessity of our nature, a requirement of our condition, by which our energies find employment and our wants are supplied; and he who thus tries and succeeds, is a public benefactor. The man who causes two spears of grass to spring up where but one grew before, or saves time and hand work in the performance of labor, or increases useful productions of any kind, deserves the gratitude and thanks of his fellows. But if any such improvement is deserving of credit and reward, much more is that which is the best of its kind, which is not only an advantage to the world, but the greatest benefit of which the subject is susceptible or at least has hitherto received. These thoughts were forcibly suggested the other day by an examination of Mr. T. R Allen's model for a new hive, truly called "The Home."

The cultivation and improvement of bees with reference to the production of honey, is an old and honorable occupation which has done much to sweeten the acidity of life. Honey has always been taken as the type of sweetness for the taste, and has even been supposed to clear the intellect. "Butter and honey shall he eat that he may know how to refuse the evil and choose the good." It is said of Sophocles, a Greek writer of great sweetness, that the bees settled on his lips in the cradle. Virgil devoted a whole book of the Georgics to an accurate and minute description of bees, their habits and right management as practiced in his time, showing that the ancients highly appreciated the importance of this little insect in contributing to their wants and enjoyments. And the moderns have improved in this case, as in almost all others, upon the old models, having studied the bee with close inspection

and rigid thoroughness; stimulated thereto not only by the gratification of the palate, but also by pecuniary advantage, since the making of honey is highly profitable.

Next to a due supply of food, the home of the bee is of greatest importance. This should be so constructed as to fulfil two main indications; the one, that it be suited to the insect's just requirements of labor and rest, and really be a snug and comfortable home in which it may live well and work comfortably; and the other, that the apiarian should have easy, safe and quick means of performing all his operations.

While the hives in common use—Langstroth's and others—fulfil to some extent these conditions, that of Mr. Allen, combining as it does, their advantages, and leaving out their defects, as well as presenting some new features of its own, may claim as we think with justice, a clear pre-eminence.

Without stopping to describe all its good points, or dwell upon any, we will merely indicate two new and important additions possessed exclusively by this hive.

These are first, an entire movable outside, capable of easy and safe removal and replacement. On all other hives this is a permanent part of the hive, except indeed, the top or cover.

The advantages of Mr. Allen's plan are that the whole interior of the hive is better exposed to the view and manipulations of the apiarian, and less disturbance of the swarm by blows or motion of any kind.

But perhaps the most important improvement consists in the frame work and frames. The frame work (best made of cast iron) is so constructed by means of bevels or hinges at the top, and sacks at the bottom, that the frames are securely fixed at proper equal distances from each other, while they may be easily withdrawn through each side, instead of being lifted out as is the case in other hives. But we are running on at length, induced by the seduction of the subject, and will close by inviting all interested in bee-culture to call at No. 182, E. R. R. Streets and examine Mr. Allen's model. If such are not repaid for their time and trouble, we shall be much disappointed.

WM. A. BENNETT.

SYRACUSE, MAY, 1867.

AGE will cause hives to weigh heavier than their *legitimate* contents would call for. This is caused by an accumulation of *bee bread*, or pollen, in the cells, and also of the cast slough which formerly served as envelopes for the young In the case of old hive, therefore, an allowance of from two to five pounds must be made for these matters, according to age, when endeavoring to estimate the honey contents of the combs.

SNAILS and slugs are not to be classed among the true enemies of bees, as they have no design upon them or their honey in entering the hive, but merely do so from accident. The mischief done by them consists in the alarm and confusion they occasion.

Facts about the Honey Bee.

EXTRACTED AND TRANSLATED FROM DR. ED. ASSMUSS.

When a hive swarms, the young bee colony generally gather together, before going farther, in the vicinity of the parent hive, in order to rally and to rest, as they are heavy with the honey taken along for the voyage. The place for this is chosen by the workers, not by the queen, as was formerly generally believed, and is mostly a densely leaved low shrub or tree, of which more hereafter. It occurs but seldom that the colony does not gather in this way, but flies off at once.

Sending out Reconnoitrers.—When the colony has rested in this way for a time, they despatch a few workers, reconnoitrers or quartermasters so to say, who search for a new habitation, and, when they have found one, guide and direct the colony to it. Sometimes the new habitation is selected already while the intended colony still remain for a time in the parent hive; this is done especially by first swarms.

Clustering in the new Habitation and the first Occupations.—The swarm on entering the new habitation, suspends itself from the top or ceiling in the shape of a cluster of grapes, which is formed by a great number of garlands crossing each other in all directions, each containing a greater or lesser number of bees according to the size of the garlands; these are formed by the first two bees clinging with their forelegs to the ceiling of the hive, the next two with their fore-legs to the hind legs of the two first ones, and so forth. Their first occupations are—to cleanse the habitation, to make wax for building material, to reconnoitre the new environs in order to fly out safely after forage. These are the only occupations for the first two or three days.

Reconnoitering, Circle of Flight, and Eyes of the Bee.—The bees reconnoitre by describing a small circle around the hive, which grows larger and larger, and they do not fly off until the hive, its location and environs are thoroughly noticed. The circle of flight of the bees has, according to recent careful observations, a radius of half a German mile (equal to 2½ English miles.) This remarkable and extraordinary ability of the bee to find her way is owing to her five eyes. Two of these stand on the side of the head, are large kidney-shaped, and composed of many thousand of hexagonal convex facets adjoining each other, like the meshes of a net, each facet representing a separate eye, and which are divided by a few single hairs. Because of this construction, they are called composite, faceted, or net eyes. Those of the male are larger, and touch each other, as mentioned before, on the top of the head; the facets are also larger than those of the queen and the workers. The other three eyes consist of a single hemispherical horny skin, like three little knobs standing in the form of a triangle, the apex forward, the base behind. As mentioned before, these eyes the males have on the forehead, the queen and the workers on the top of the head. All these eyes are provided with

nerves from the two nerve centres of the head which may be designated as the brain of the bee. The eyes are constructed only for seeing in the daytime; in the dark the bees are blind.

Cleansing and Preparing the Habitation.—This consists in the workers biting off all uneven or protruding parts, as splinters of wood, pieces of straw, etc, and is done by means of their strong mandibles. In most cases these gnawed off parts are thrown from above to the bottom of the hive; and only later, when the bees have made more progress with their structure, do they cleanse out the bottom. Some of it, however, is carried out at the time it is gnawed off.

The Production of Wax.—At the same time with the cleansing of the habitation commences the production of wax. The wax is a secretion of the body of the bee, and is formed only when the bee is richly provided with food, like fat in the higher animals but with this difference that while fat grows upon the animals without their knowing it, the production of wax is entirely optional with the bee. It is fully within the power of the bee to make wax or not to make any. In order to produce wax, the worker-bee takes in considerably more pollen and honey both of which constitute their food, than is necessary to appease her hunger. In the chyle-stomach or stomach proper, these materials are first transformed by a partial digestion into food, sap, or jelly, which has been mentioned already as the food of the drones and the queen, and this is after twenty-four hours thoroughly digested and passes into the blood, from which it is secreted as wax, in the form of thin, irregular pentagonal white flakes, looking like selenite, between the segments of the abdomen through the thin wax skin of the bee into a separate apparatus.

The Wax-Secreting Apparatus is on the lower side of the abdomen, and is formed of the four inner segments out of the six; these four inner segments consist of two parts, the interior being a thin, soft, translucent skin or membrane, the posterior a harder, darker skin, covered on the outside with hair, the first or soft part is surrounded by a horny rim, with a point on each side. Through the centre of the wax-secreting apparatus runs a horny partition, dividing it into two equal parts, whereby these four wax secreting segments form eight superficies, which, as the apparatus is oval, are larger in the middle, at the third segment and smaller towards both ends. In shape, these superficies form irregular pentagons. The horny rims of the wax skins or membranes are connected by a delicate membrane with the next segment, and the wax skin itself is drawn back under the hard outer skin, so that the eight superficies form four pairs of pockets, into which the wax substance penetrates through the wax skin or membrane, and receives the shape and size of the respective superficies.

As soon as the secretion of wax has commenced, the bees begin at once to use the wax flakes for the construction of comb. This comb building always has its beginning at the ceiling of the hive, in the centre of the cluster of bees.

For the American Bee Journal.

Purity of Italian Bees, and other Matter.

MR. EDITOR: There is so much said and written about the purity of Italian bees that a person who reads your JOURNAL and would wish to procure these bees in their native purity, must either be greatly puzzled to know in what this purity consists, or blindly believe that anything in the shape of a bee, differently colored from the black, is pure, provided it cost him ten or twenty dollars, and he has obtained it from a person that can blow his horn the loudest. The aspersions and inuendos thrown out by certain pedlers in this commodity, and the ignorance and conceit exhibited by others who poke themselves before the unsuspecting good people, as their quasi judges and teachers in apiculture, are, indeed, to me at least, very refreshing. The way they prepare for a successful sale, is all that could be desired in their favor, and the cash they covet induces them to pave the road to success with innumerable stumbling blocks. One seems to think that because he has written a book on bees, the good people take what he says as a matter of the utmost reliability. To make assurance doubly sure he informs his correspondents that: "If the workers of any queen do not show distinctly *the yellow band*, she is considered impure by the best apiarists, and should not be expected to breed pure queens: * * * and that it will probably appear that some which show the three rings distinctly when the abdomen is filled with honey or otherwise distended, will often show but one distinctly when it is empty or contracted, as is evident from workers that *he* has raised from a tested queen procured of Mr. Langstroth." This gentleman, and another like him, to form the plurality, are evidently and obviously figured here as the *best apiarists*; but to *my* certain knowledge, the best apiarians always speak of *three yellow rings*, and so does Mr. Langstroth.

Another is greatly pleased when he can raise and represent in wood cuts, and recommend by circular and otherwise, *big* and *beautifully yellow* Italian queens. This person is honest enough, and would of a certainty pick the only hybrid queen from a dozen pure ones, as he has evidently never seen a pure one in his life. A third thinks his tested Langstroth queen produces black queens, when either the original pure one was killed off at its introduction, or Mr. Malapertus neglected to destroy the queen cells a week or so after its introduction, and the top swarm, with the Langstroth queen, flew to the woods, while its owner finds, by his afterswarm, that Mr. Langstroth's tested queen produces black queens.

A fourth still goes one step further, and by implicitely advertising Italian queens for sale, informs the good people at the same time, with an assurance most persuading, that he bought three queens from Mr. Langstroth, one of which he tested for breeding, and raised three *splendid yellow ones*. And here let me add, sir, that these three *splendid yellow ones*, however like they may be to any in his apiary, are, notwith-

standing, according to my experience, not at all pure, for the very reason that pure Italian queens are not like hybrids *splendid*, nor like hybrids *yellow*, but brown, with a black dot or two upon the body.

Now, if either Mr. Quinby, or Mrs. Tupper, or Mr Grimm, or Mr. Flanders, or Mr. anybody else knows of no better and more reliable test of purity than what they advance by paper cuts or yellow bedabbled wood cuts, in your JOURNAL or otherwise, I would here as publicly as they advertise, yet most respectfully, suggest that neither and none of them have any *pure Italian* queens, no matter from what source they may have obtained them, and no matter whether their workers have, like Mr. Quinby's *one yellow band*, or like Mr. Langstroth's *three yellow rings*. And now, I shall proceed to state what, in my humble opinion, constitutes the only true and exclusively reliable test of purity in Italian queens, to wit: *Impeccability of temper in their worker progeny*, in addition to the distinctive *three yellow bands* by which they are known in Italy and Switzerland. Tut! Tut! Gentlemen, I have no queens for sale, nor would I sell a *pure queen* for less than twenty or thirty dollars, if I had a tested one to spare. I have raised sixteen flying ones and none impure; nor have I any Italian bees that will sting, or need sugar water or smoke, or bee charm, to keep them quiet. When I open the hives, those that are between the frames and honey-board will range themselves, "rank and file," with their heads even with the top bar of the frames, and there look at me as if to say: How do you do, sir? None will leave the comb without shaking, and hardly then, and in the *comb-ical* tenacity, I discover another comparative and tolerably sure test of purity. The *one-banded* Italian bees (?) that by the slightest twitch of a nerve, drop from the comb like so many kernals of hybridized corn, are not any more pure than those kicking, long-eared, tufty-tailed, dissyllabic ponies (?) are pure horses—both are "an abomination unto the Lord"—an abuse of nature and a curse in a quiet homestead. I have repeatedly, with one naked hand, brushed my bees from the alighting-board into the other, and thrown them, by permission of visitors to my apiary, into their naked faces, or my own, without a single sting. I have come across them in my pant's pockets, in my trowserloons, and in my bed, without a single sting. I have spit among them, dropped the burning embers from my cigar among them, and dropped the bees themselves alive upon my tongue without a single sting. I actually sat down, in a pair of linen pants, upon the frames, by mistaking the open for a closed hive, during conversation with a friend, and thus broke down the whole fabric without one single sting. With my bees the original report of their inability to sting is strikingly verified; hence I must conclude that my bees are the *pure Italian bees*, yet their mothers are neither *splendid*, nor *yellow*, nor yet *black*, but *dark brown*, with a very diminutive black dot or two upon their posteriors, yet withal much smaller than *genuine hybrids queens* and very handsome.

Now, gentlemen, I have queens from two different sources; the first from Rev. L. L. Langstroth & Son, and the others from a Swiss cousin who imported them by my request (not expressly) from his own yard, where he assures me they were raised without especial care or attention. Both Langstroth's and the other queens have so far invariably produced mothers and workers so nearly alike in color, shape, and disposition, that a good judge might readily mistake one for the other. Of Mr. Langstroth's queen I have just raised the third generation as to mother from mother, and all, without one single exception, have turned out pure. Of the Swiss, I have only the first generation tested, and trust their progeny may prove as pure and give me as much satisfaction as their progenitors.

Raise more drones, gentlemen, raise fewer queens, test them with a view to *impeccability of temper*, and distinctive coloring *exclusively*, and when you sell, charge bigger prices, and you will give *bigger satisfaction*.

I am, gentlemen, respectfully and disinterestedly, yours,

PROF. F. VARRO, A. M.

CANTON, PENNA., JUNE 15, 1867.

[For the American Bee Journal]

I fully concur with M. S., of New Salem, Ohio, in the remark concerning smoke. I have fully proved the smoke of wood to be quite sufficient for all purposes. But a simpler plan of using it than that given by M. S, is to split your rotten wood into pieces of from four to six inches long and say about an inch in thickness; though size or shape is of no great consequence in practice. Then light one end, hold it by the other, and blow the smoke among the bees. All the smoke pipes in the world sink into insignificence compared with it. Try it and I am sure you will use nothing else. But when rotten wood is not convenient, a few chips put in a common tin pie pan and a coal laid on them, will answer. J. H. THOMAS.

BROOKLIN, C. W.

Liberian Honey Bee.

In a barrel of molasses brought over by the American Colonization Society's ship Golconda, on her last voyage, were a great number of honey bees. Being struck by their bright colors, I took several specimens home, and after cleaning them, their markings were very striking. On the back part of the thorax there is a yellow crescent, the rest of the thorax being very black. The first three rings of the abdomen are yellow, like those of the Italians. The other rings are black, with white borders, so that the general effect is very beautiful.

The bee is somewhat smaller than the black and Italian varieties.

D. M. WORTHINGTON.

ELKRIDGE, MD., JUNE 6, 1867.